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ENHANCING INTERNAL AUDIT AND CONTROL COMPETENCIES THROUGH MOTION GRAPHICS: A FOUNDATION FOR SUSTAINABLE CORPORATE GOVERNANCE IN ACCOUNTING EDUCATION

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Abstract

Recognizing challenges in conveying abstract accounting concepts, this study aimed to 1) develop motion graphics, 2) evaluate their quality and instructional effectiveness using E1/E2 criteria, 3) compare student learning achievement against traditional methods, and 4) assess student satisfaction. In an experimental design with 34 students in each group, media development followed the ADDIE model. It was guided by principles from the Cognitive Theory of Multimedia Learning (CTML), Constructivist Theory, and Spaced Repetition. The findings reveal that the motion graphic media is of excellent quality and highly effective, exceeding the 80/80 standard with an E1/E2 score of 82.40/85.60. Students using motion graphics demonstrated significantly higher learning achievement ($p < .001$) than the control group and reported the highest level of satisfaction. These results underscore that motion graphics offer an engaging and effective pedagogical approach for complex accounting topics. By enhancing students' understanding of internal audit, control, and corporate governance, this innovative educational tool directly fosters the competencies essential for ensuring transparency, accountability, and robust risk management—all foundational elements for sustainable corporate reporting and practices in the Asian context.

Keywords: Motion Graphics, Internal Audit, Internal Control, Accounting Education, Corporate Governance

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Introduction

In the digital era, multimedia technologies play a pivotal role in accounting education, a discipline demanding an in-depth understanding of complex principles and applications. The Internal Audit and Internal Control course, typically characterized by lecture-based instruction and abstract concepts, often leaves students struggling to connect theoretical content with practical scenarios. Developing accessible, on-demand digital learning media is therefore crucial for fostering continuous learning. Motion graphics present a highly suitable solution, seamlessly integrating animation, audio, and text to make intricate processes more concrete and memorable while reducing student anxiety (Alhyari et al., 2025). Tailoring these media to the learners' context not only enhances long-term retention (Kleftodimos, 2024) but also promotes an inclusive and equitable learning environment (Nugrahani & Yuly, 2024). Despite proven effectiveness in other disciplines, there is a notable lack of systematic research on the application of motion graphics in professional accounting courses. This gap underscores a genuine need for studies focused on developing and evaluating media tailored explicitly for accounting education.

Given these identified challenges, developing high-quality motion graphics media as a supplementary tool is essential to bridge theoretical knowledge and practical application. To address this gap, this research aims to: 1) develop motion graphic media tailored to the Internal Audit and Internal Control course; 2) evaluate its instructional effectiveness; 3) compare students' learning achievement between experimental and control groups; and 4) assess student satisfaction. By providing a vital resource that enables Bachelor of Accountancy students to review lessons independently, this study ensures that the developed media meets rigorous learning standards while fostering continuous, self-directed learning.

Literature Review

Concepts and theories related to learning and the development of digital learning media are grounded in theories emphasizing student information processing and knowledge construction. A key theory in this regard is the Cognitive Theory of Multimedia Learning (CTML) (Mayer, 2005), which posits that humans possess two primary sensory channels for information reception: visual and auditory. Learning becomes more effective when students receive information through both channels concurrently. For instance, presenting content with synchronized images, audio, and text helps students understand and retain the material more deeply and for longer periods than text-only presentations. This concept is supported by recent research. Çeken & Taşkın (2022) conducted a systematic review of the application of multimedia principles across various learning environments and found that media design aligned with CTML principles can enhance learning effectiveness. Similarly, Teng's (2023) study on the impact of multimedia on vocabulary learning in English contexts revealed that students exposed to media with integrated visuals and audio understood and remembered vocabulary significantly better than a text-only control group. These findings are consistent with CTML, which emphasizes stimulating students' cognitive processes through both visual and auditory media, coupled with active engagement. This is particularly relevant in the Asian learning context, which has traditionally been teacher-centered. Ting et al. (2023), who reviewed studies from various Asian countries including Taiwan, India, Korea, Malaysia, Hong Kong, Indonesia, China, Singapore, and Thailand, found that Active Learning management significantly improves student achievement in STEM fields, reflecting that instructional design integrating multimedia and active engagement is appropriate for the Asian cultural learning context and can effectively promote active student roles.

Additionally, the Constructivist Theory (Jonassen & Rohrer-Murphy, 1999) views learners as active constructors of knowledge through interaction with their environment and direct experience. Learning, therefore, occurs when students connect new information with their

existing experiences. This aligns with trends in Asian learning contexts, as evidenced by empirical research increasingly emphasizing active learning and student engagement to overcome the limitations of prevailing lecture-based instruction. Mayer's (2024) research further supports this idea, indicating that media designed to reduce cognitive load and promote relational thinking can foster greater constructive learning. However, Clegg et al. (2022) note that although multimedia can increase students' perceived understanding, actual learning outcomes may not differ significantly. Beyond designing media aligned with student cognitive processes, the structure of learning sequences and opportunities for systematic content review are also crucial factors affecting learning effectiveness. The concept of Spaced Repetition is an empirically proven psychological learning principle, which states that reviewing content "multiple times with intervals" leads to better long-term memory and deeper understanding than massed practice (Cepeda et al., 2008). When combined with retrieval practice, this method further enhances learning retention. In recent years, educational research has reported positive outcomes from using spaced repetition through digital tools and structured review activities. These studies found that spaced repetition can significantly improve learning outcomes and/or knowledge retention compared to traditional instruction in higher education and professional learning contexts, such as mobile flashcard applications (Santhosh et al., 2024), spaced learning management for learning outcomes and retention (Khalafi et al., 2024), and applying spaced repetition activities to enhance learning for Thai university students (Saksittanupab, 2024). Furthermore, the design of digital media that allows students to control their learning pace and independently revisit content aligns with multimedia learning principles emphasizing cognitive load management and self-regulation. This makes the concept of spaced repetition a crucial framework for explaining the mechanisms of digital media. While classic research provides the theoretical foundation for explaining student learning mechanisms, contemporary research offers empirical evidence of their application in current learning contexts, particularly in Asia. Based on the literature review, this study integrates CTML and Constructivist Theory. CTML serves as the basis for designing motion graphics media that align with students' cognitive processes by effectively integrating visuals and audio. Simultaneously, Constructivist Theory frames the design of activities and media content to enable students to interpret actively, connect prior knowledge with new information, and construct understanding independently, which is well suited to Asian students transitioning from passive, reception-based learning to more active, engaged learning.

Motion Graphic Media Concept

Motion graphic media is a digital medium that combines motion visuals, colors, sounds, music, and text to convey complex content in an easy-to-understand, memorable way. A distinctive feature of this media type is its ability to transform abstract or difficult-to-understand information into concrete visual representations through continuous, coherent motion synchronized with the content. This stimulates both visual and auditory perception, leading to deeper information processing and enhanced long-term memory (Wicaksana et al., 2023). In terms of educational communication, motion graphics media is an innovation that falls midway between static images and videos, as it can evoke emotion, create continuity, and tell stories through animated visuals and sound. This makes students more interested and focused on the content for longer periods. Additionally, this type of media offers design flexibility, enabling adaptation to diverse student groups based on age, educational level, and prior knowledge. For example, using comparative animations or symbols can help students systematically grasp complex concepts such as accounting processes or internal control principles. Research has confirmed the effectiveness of motion graphic media in promoting learning outcomes. For instance, Zulkarnain et al.'s (2023) study on motion graphics-based learning media for work and energy found that the developed media was highly appropriate in terms of content, design, and student satisfaction, and that it significantly improved students' comprehension and

motivation. Similarly, Wicaksana et al. (2023) studied the development of motion graphics media on the animal kingdom for secondary school students. They found that the media was over 90% suitable for use and helped students understand complex scientific content more easily. This reflects that motion graphic media can effectively cater to students in Asian countries, which typically have teacher-centered learning, and can support active student learning. Moreover, Alhyari et al.'s (2025) study found that using motion graphics rather than text-based content significantly reduced student anxiety and increased motivation compared with a text-only control group. This indicates that motion graphic media not only improve learning achievement but also positively affect students' psychological and attitudinal aspects, particularly confidence, enjoyment, and engagement in the learning process. These findings align with trends in Asian learning contexts that prioritize building student motivation and engagement through diverse digital media. Furthermore, the use of motion graphics strongly aligns with Mayer's (2024) Cognitive Theory of Multimedia Learning (CTML), which posits that learning is most effective when students receive information through both visual and auditory channels concurrently. This integrated presentation of images, sound, and text helps students systematically connect information while significantly reducing cognitive load. Simultaneously, within the framework of Constructivist Learning Theory, motion graphics facilitate the design of interactive experiences that enable students to interpret, construct meaning, and effectively link prior knowledge to new concepts. By shifting students from passive receivers to active, engaged learners, motion graphics prove to be a highly suitable and innovative educational tool, particularly within the Asian learning context.

Media Effectiveness Evaluation

Evaluating the effectiveness of learning media is critical for determining whether the media support learning objectives and for helping researchers or developers improve the media's content and presentation. The E1/E2 criteria are commonly used for evaluation and are widely accepted in educational technology research. E1, or the Efficiency of Process, measures the outcomes of in-process learning activities, reflecting how well the media stimulates student engagement and comprehension during learning. E2, or the Efficiency of Learning Outcomes, measures students' achievement after completing the learning process, indicating whether they have acquired the knowledge and understanding aligned with the set objectives (Asanok, 2018). The E1/E2 approach is rooted in systemic evaluation concepts in educational technology, which concurrently consider both the learning process and student outcomes to reflect the overall media effectiveness. Thus, E1/E2 evaluation helps comprehensively capture both the process and outcome dimensions of learning. However, Clegg et al. (2022) suggest that media effectiveness evaluation should not rely solely on achievement scores, as these may not fully reflect students' true understanding. Other factors should also be considered, such as cognitive load, which refers to the complexity of information students must process, and learner experience during media usage. Both factors influence students' perceptions and long-term retention, consistent with Mayer's (2005) Cognitive Theory of Multimedia Learning, which emphasizes designing media that address human cognitive limitations to reduce cognitive load and enhance learning effectiveness. Additionally, Alhyari et al. (2025) propose a holistic evaluation approach that includes emotional and motivational factors, as quality media should not only help students understand content but also evoke enjoyment, enthusiasm, and a desire for continuous learning, which are vital components of learning outcomes in the digital age. This concept underscores the need to evaluate media effectiveness across a broader range of academic dimensions, especially in Asian learning contexts, where fostering motivation and positive attitudes toward learning is a key factor in the success of active learning management. Integrating E1/E2 criteria with emotional and motivational measures can therefore provide a more comprehensive reflection of media effectiveness. Integrating traditional E1/E2 criteria with emotional and motivational measures provides a comprehensive reflection of media

effectiveness. By adopting this holistic approach, the study ensures an evaluation that captures both instructional efficiency and active student engagement, aligning perfectly with CTML and Constructivist principles tailored to the Asian educational context.

Student Satisfaction Evaluation

Evaluating student satisfaction is a crucial process for assessing students' opinions and attitudes towards the quality of learning media, covering aspects such as content, ease of understanding, attractiveness, usefulness, and perceived benefits. Typically, a 5-point Likert-scale questionnaire is used to systematically assess students' satisfaction levels (Nafis & Fathurrahman, 2024). Student satisfaction is influenced by several factors, including readiness for online learning and the quality of interaction with the system (Yılmaz, 2023), as well as the quality of e-learning system services, content, and instructors (Limbu & Pham, 2023). Enyoojo et al. (2024) found that the user experience and technical support for online platforms significantly impact student satisfaction. These studies indicate that satisfaction results from a combination of media quality, technology, and overall learning management processes. In the Asian context, recent research suggests a direct correlation between the design of digital learning environments and system quality with student satisfaction. For example, Fu et al.'s (2025) study in China found that open education management and learning experiences that promote participation significantly affected student satisfaction. Alshathry & Alojail (2024) also reported that online system quality and interaction levels significantly influenced satisfaction among higher-education students, indicating that media design and learning-system factors play a crucial role in shaping students' learning experiences in Asia. Moreover, student satisfaction can be explained within the framework of CTML, as media designed to reduce cognitive load and present information in an integrated visual and auditory manner facilitate understanding and foster positive learning experiences, leading to higher satisfaction levels (Mayer, 2005). Concurrently, Constructivist Theory suggests that providing opportunities for students to participate in knowledge construction actively enhances their sense of ownership and fosters a positive attitude towards learning overall. Consequently, this study evaluates student satisfaction by examining media quality, ease of use, attractiveness, and perceived benefits, as well as students' emotional experiences. This multifaceted assessment leverages both CTML and Constructivist frameworks to determine the media's suitability and impact on learners comprehensively.

Research Hypotheses

H1: The developed motion graphic media meets the E1/E2 efficiency criteria at the 80/80 standard.

H2: Students who received instruction using motion graphic media demonstrate significantly higher post-learning achievement than those who received traditional instruction.

H3: Students who received instruction using motion graphic media report a higher level of satisfaction with the media.

Conceptual Framework

Input	Process	Output
- Internal Audit and Internal Control Course Content - Multimedia Design Principles & Multimedia Learning Theories - Motion Graphic Production Technology - Target Group: Bachelor of Accountancy Students, Yala Rajabhat University - Evaluation Instruments: Pre-test, Post-test, Student Satisfaction Questionnaire	- Analysis - Design - Development - Implementation - Evaluation	- Motion graphic media for enhancing learning in the Internal Audit and Internal Control courses - Media Effectiveness (E1/E2) - Student Satisfaction with Media Usage

Figure 1 Conceptual Framework

Methodology

Population and Sample

This study is a Research and Development (R&D) project. The population comprised Bachelor of Accountancy students at Yala Rajabhat University enrolled in the Internal Audit and Internal Control course for the 2025 academic year. The sample was selected using purposive sampling, divided into two groups: an experimental group and a control group, each consisting of 34 students. The inclusion criteria for participants were: 1) enrollment in the specified course during the designated semester, 2) full participation in learning activities according to the prescribed learning plan, and 3) voluntary consent to participate in the research. The exclusion criterion was applied to students who failed to complete essential tests or questionnaires, resulting in incomplete data.

Data Collection

The research instruments included:

1) Motion graphic media: Developed according to the ADDIE Model (Seels & Glasgow, 1998), utilizing Adobe After Effects, Illustrator, and Premiere Pro. The media underwent quality evaluation by three experts, considering content consistency, instructional design, and presentation clarity. Researchers incorporated expert feedback prior to implementation. Additionally, a learning management plan integrated these graphics as supplementary materials, aligning with the course outcomes for Internal Audit and Internal Control and with the Thai Qualifications Framework for Higher Education 2022.

2) Learning assessment instruments: Comprising a pre-test, in-process tests (to evaluate E1 efficiency), and a post-test (to evaluate E2 efficiency and compare achievement via ANCOVA). All tests consisted of 4-option multiple-choice questions with randomized orders. Validated by three experts (average IOC = 0.89), the tests were piloted with 30 comparable students. Item difficulty (P) ranged from 0.40–0.80, and discrimination (r) ranged from 0.35–0.70. The Kuder-Richardson 20 (KR-20) reliability was excellent at 0.97 (Kuder & Richardson, 1937).

3) Student satisfaction questionnaire: A 5-point Likert-scale tool measuring content comprehension, media attractiveness, visual/audio suitability, ease of use, and motivation. Validated by three experts (average IOC = 0.88), the instrument was piloted with 30 students, yielding a highly acceptable Cronbach's alpha reliability of 0.86 (Cronbach, 1970; Fraenkel & Wallen, 2009).

Data collection was conducted during the 2025 academic year. Following the administration of the pre-test to both groups to establish baseline knowledge, the experimental group received instruction utilizing the newly developed motion graphic media alongside traditional teaching methods, while the control group received exclusively traditional lecture-based instruction. In-process tests were administered to the experimental group after each of the 10 lessons, followed by a comprehensive post-test and a satisfaction questionnaire upon completion of the course. Simultaneously, the control group completed the same post-test, ensuring standardized comparative data for subsequent analyses.

Data Analysis

Data were analyzed using appropriate descriptive and inferential statistics. The mean and standard deviation were used to summarize student satisfaction and learning achievement scores. The efficiency of the motion graphic media was determined using the established E1/E2 criteria, comparing in-process and post-test scores of the experimental group against the 80/80 standard. To evaluate the media's instructional impact, an Analysis of Covariance (ANCOVA) was employed to compare post-learning achievement between the experimental and control groups, utilizing pre-test scores as the covariate to account for any baseline differences. All inferential analyses were conducted at a statistical significance level of .05.

Results

Development and Quality Evaluation of Motion Graphic Media

The motion graphic media was developed following the ADDIE Model, covering the pre-production, production, and post-production phases. This included concept definition, storyboard creation, graphic and animation development using Adobe After Effects, Adobe Illustrator, and Adobe Premiere Pro, and final audio integration and editing to produce .mp4 files. The development resulted in 10 instructional motion graphic lessons (as shown in Figure 2), each lasting approximately 3-6 minutes, covering core content for the Internal Audit and Internal Control course. The media underwent an expert evaluation and received an overall "most suitable" rating (Mean = 4.87, S.D. = 0.04) (Fraenkel & Wallen, 2009). This indicates that the developed motion graphic media is appropriate in terms of content, instructional design, presentation, and student level, making it well-suited for teaching and learning.



Figure 2 Examples of Motion Graphic Media to Enhance Learning in the Internal Audit and Internal Control Course

Efficiency Evaluation of Motion Graphic Media

The efficiency of the motion graphic media was evaluated using achievement tests, with the same set of test items measuring both E1 and E2. Item order and option order were randomized to prevent memorization. E1 scores were derived from in-process tests taken after each motion graphic lesson, while E2 scores were obtained from the post-test administered after students completed all lessons. The calculation results showed that the developed motion graphic media achieved an E1/E2 efficiency of 82.40/85.60 (as detailed in Table 1), surpassing the 80/80 standard for learning media efficiency. This demonstrates that both the learning process and the learning outcomes align with the curriculum's learning outcomes as specified by the Thai Qualifications Framework for Higher Education 2022.

Table 1 Motion Graphic Media Efficiency Evaluation Results

Evaluation Type	Full Score	Mean Score ($\bar{X}$)	Percentage Efficiency (%)	E1/E2 Standard ($\geq 80/80$)	Evaluation Outcome
In-process (E ₁)	120	98.88	82.40	≥ 80	Passed
Post-learning (E ₂)	120	102.72	85.60	≥ 80	Passed

Comparison of Learning Achievement between Experimental and Control Groups

A comparison of pre-test scores between the two groups revealed no statistically significant difference ($F = 0.61$, $p = .436$), indicating that both groups had comparable baseline knowledge before instruction. After controlling for the influence of pre-test scores, post-test analysis showed that the experimental group's average post-test score (Mean = 84.95, SD = 4.00) was significantly higher than that of the control group (Mean = 62.18, SD = 4.80) ($F = 448.70$, $p < .001$), with a very large effect size (Partial $\eta^2 = 0.873$). This indicates that the developed motion graphic media significantly enhances students' learning achievement (as presented in Table 2). The experimental group benefited from both classroom instruction and the ability to independently review content using motion graphics, which likely contributed to a deeper understanding of the material.

Table 2 Comparison of Pre-test and Post-test Scores Between Experimental and Control Groups (ANCOVA)

Variable	Experimental Group (n = 34) Mean (SD)	Control Group (n = 34) Mean (SD)	Mean diff	F	p-value
Pre-test	39.79 (2.21)	39.85 (2.12)	0.06	0.61	.436
Post-test	84.95 (4.00)	62.18 (4.80)	22.77	448.70	< .001

Evaluation of Student Satisfaction with Motion Graphic Media

The evaluation of student satisfaction with the motion graphic media, conducted using a 5-point Likert scale among the experimental group, revealed the highest overall satisfaction (see Table 3). This indicates that the developed media effectively met students' needs regarding content comprehension, appeal, and learning experience.

Table 3 Evaluation of Student Satisfaction with Motion Graphic Media

Evaluation Aspect	$\bar{X}$	SD	Satisfaction Level
Content Comprehension	4.60	0.36	Highest
Media Attractiveness	4.65	0.38	Highest
Visual and Audio Suitability	4.56	0.37	Highest
Ease of Use	4.52	0.41	Highest
Motivation and Learning Engagement	4.57	0.40	Highest
Overall	4.58	0.39	Highest

Conclusion and Discussion

The research findings indicate that the motion graphic media, developed using the ADDIE Model, achieved the highest quality in content, instructional design, and suitability. By presenting abstract internal audit and control processes through synchronized animated visuals and narration, the media effectively facilitates deeper information processing. This success aligns well with the Cognitive Theory of Multimedia Learning (CTML) (Mayer, 2005), which posits that dual-channel information processing enhances retention and comprehension. The empirical efficiency results explicitly confirm this theoretical alignment; the calculated media efficiency of $E1/E2 = 82.40/85.60$ exceeded the standard 80/80 threshold (Brahmawong, 2013). Consequently, Research Hypothesis 1 (H1) is accepted. These findings, supported by similar studies (Çeken & Taşkın, 2022; Teng, 2023), demonstrate that well-designed motion graphics can significantly increase student engagement and mastery of challenging, abstract accounting concepts (Zulkarnain et al., 2023; Wicaksana et al., 2023; Hamidah et al., 2023).

In addition to evaluating the media's efficiency, this study examined the impact of motion graphics on students' learning achievement. The analysis confirmed that while both groups began with similar baseline knowledge, the students who engaged with motion graphic media achieved significantly higher post-test scores than those taught exclusively through traditional methods, resulting in a very large effect size. This substantial improvement reflects the pedagogical advantage of allowing students to independently access and repeatedly review the motion graphic materials outside of class. Conversely, the control group relied solely on lecture-based instruction, which inherently limited their opportunities for review. Theoretically, these results strongly align with the concept of Spaced Repetition, which posits that providing students with multiple opportunities to revisit content at appropriate intervals enhances long-term memory and deep comprehension (Cepeda et al., 2008). This study's findings are consistent with those of Khalafi et al. (2024), who found that spaced learning management significantly increased achievement and knowledge retention among higher education students. Moreover, Santhosh et al. (2024) reported that spaced-repetition activities via digital media significantly outperformed traditional methods. Based on this theoretical evidence and prior research, digital media that facilitate repeated learning enhance achievement. Consequently, Research Hypothesis 2 (H2)—positing that students instructed via motion graphic media will demonstrate higher post-learning achievement than those receiving traditional instruction—is accepted. These findings are consistent with Ramadhan et al. (2024) and Kanthong & Supahuang (2023), confirming that motion graphic media serves as a powerful alternative learning tool capable of creating a distinct advantage in achievement in complex subjects.

Furthermore, the research revealed that the motion graphics media significantly enhanced students' motivation and learning attitudes, culminating in the highest overall satisfaction ratings. Consequently, Research Hypothesis 3 (H3) is accepted. These positive evaluations indicate that motion graphics transcend mere content delivery, serving instead as dynamic tools that foster meaningful, integrated learning experiences. By encouraging students to interpret and connect visual and auditory information actively, the media successfully shifts their role from passive recipients to active knowledge constructors. This active engagement directly supports Constructivist Theory (Jonassen & Rohrer-Murphy, 1999) and aligns with contemporary research demonstrating that high-quality, interactive digital environments significantly boost student motivation and satisfaction in Asian educational contexts (Fu et al., 2025; Alshathry & Alojail, 2024). Additionally, as supported by Alhyari et al. (2025), such media effectively reduces anxiety compared to text-based formats, preparing students for long-term continuous learning. However, in accordance with Mayer's (2024) principles, instructional designers must remain vigilant regarding cognitive load, ensuring that media

remains concise and focused to produce genuine learning outcomes rather than mere perceived understanding (Clegg et al., 2022).

In conclusion, this study reaffirms that motion graphic media is a highly effective pedagogical innovation, particularly well-suited for lecture-heavy courses such as Internal Audit and Internal Control that require bridging abstract principles and practical application. By transforming passive listening into an interactive, multi-sensory experience, the media facilitates relational understanding consistent with multimedia learning frameworks. Furthermore, from a sustainability perspective, this digital tool offers significant potential for scalability across future cohorts, reducing reliance on physical materials, optimizing instructional time, and fostering the self-directed learning essential in the digital age. However, as this research was conducted exclusively with Bachelor of Accountancy students at Yala Rajabhat University, the findings inherently reflect this specific institutional context. Future research should expand sample diversity and conduct cross-institutional comparative studies to validate these conclusions and ensure their broader applicability across diverse educational settings.

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Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

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